

Title: POLYNUCLEOTIDE AND POLYPEPTIDE FAT
METABOLISM REGULATORS AND USES THEREOF

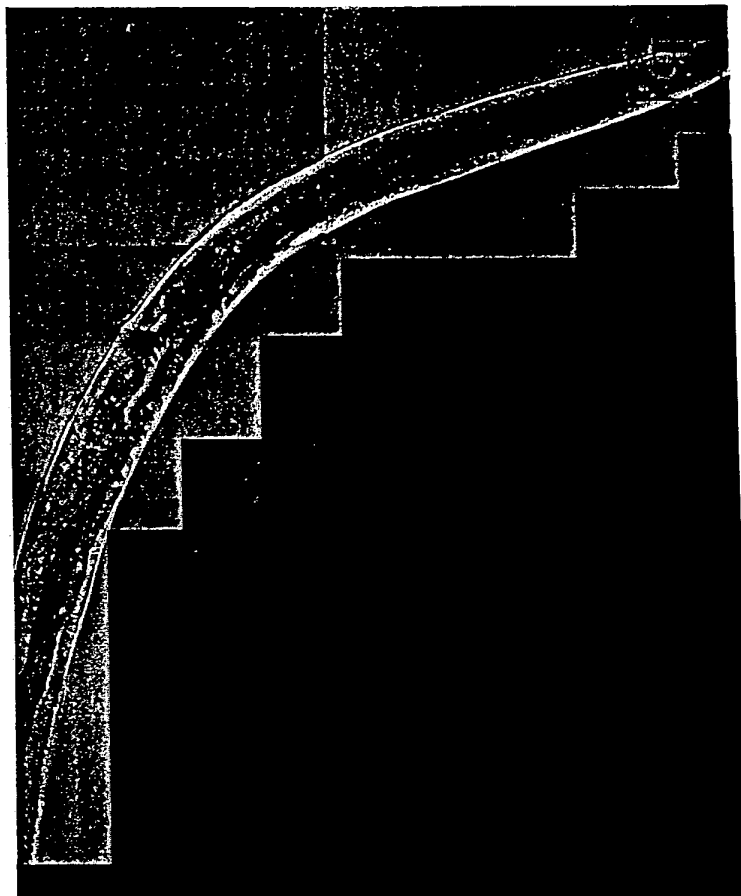
Applicant(s): Gary Ruvkun et al.

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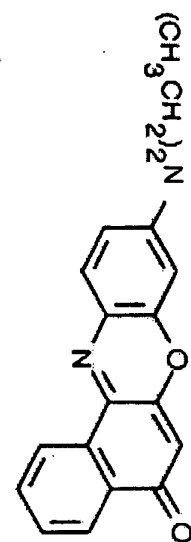
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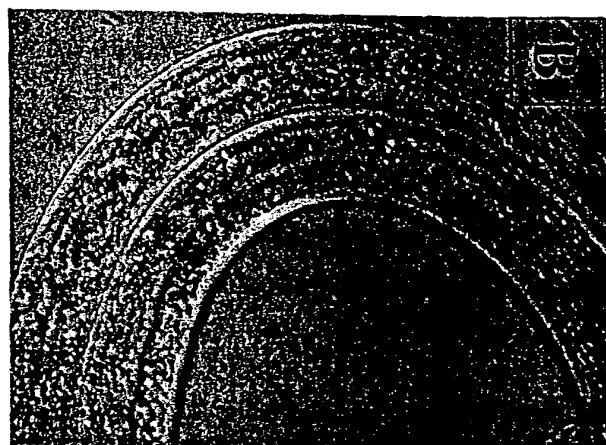
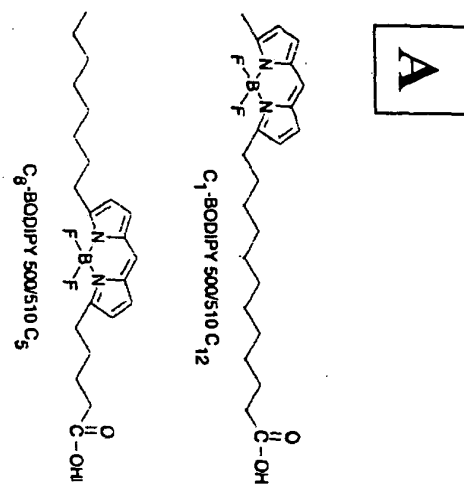
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FIGURES 1A-1B



A





FIGURES 2A-2D

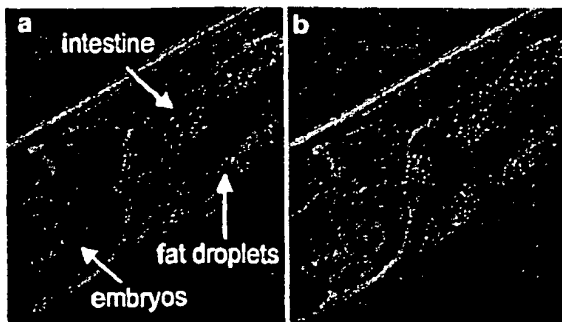
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FIGURES 3A-3B

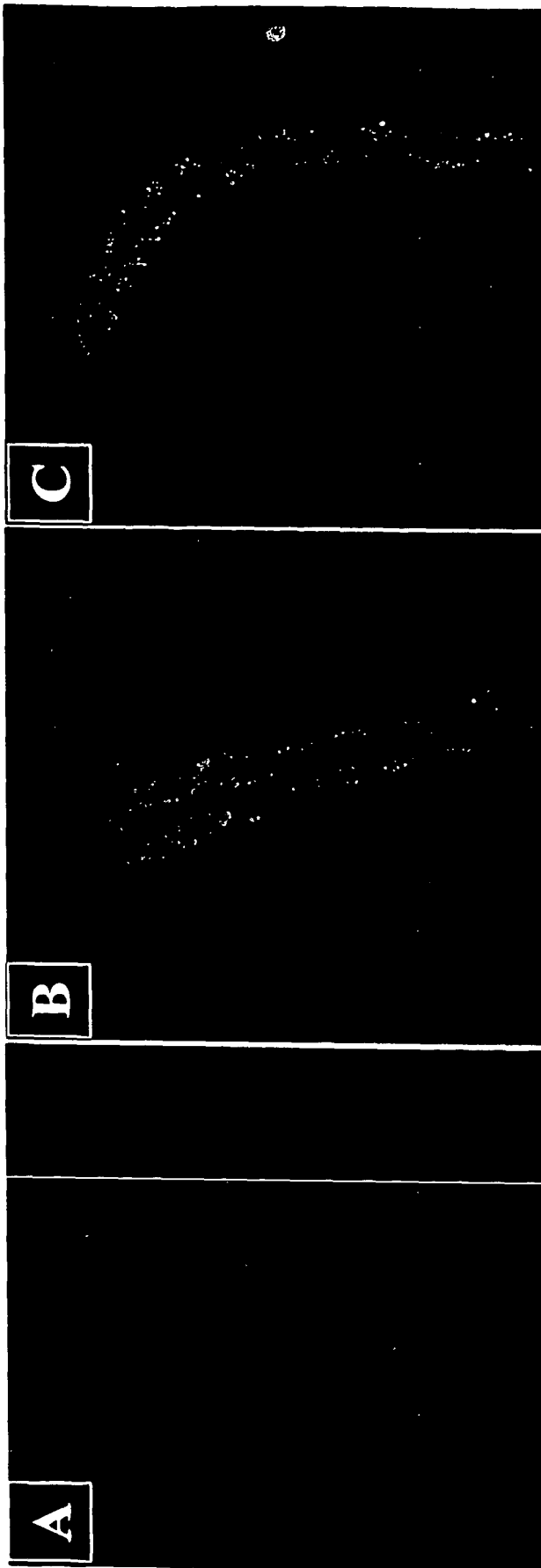
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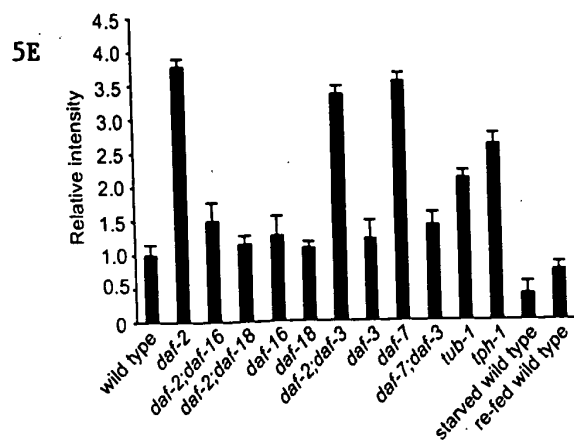
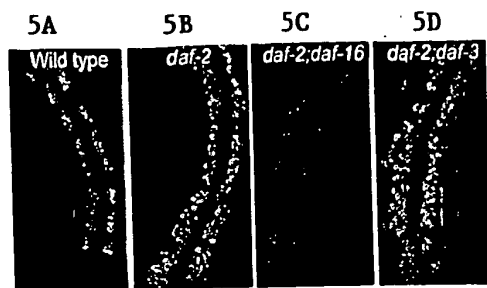
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FIGURES 4A-4C



FIGURES 5A-5E

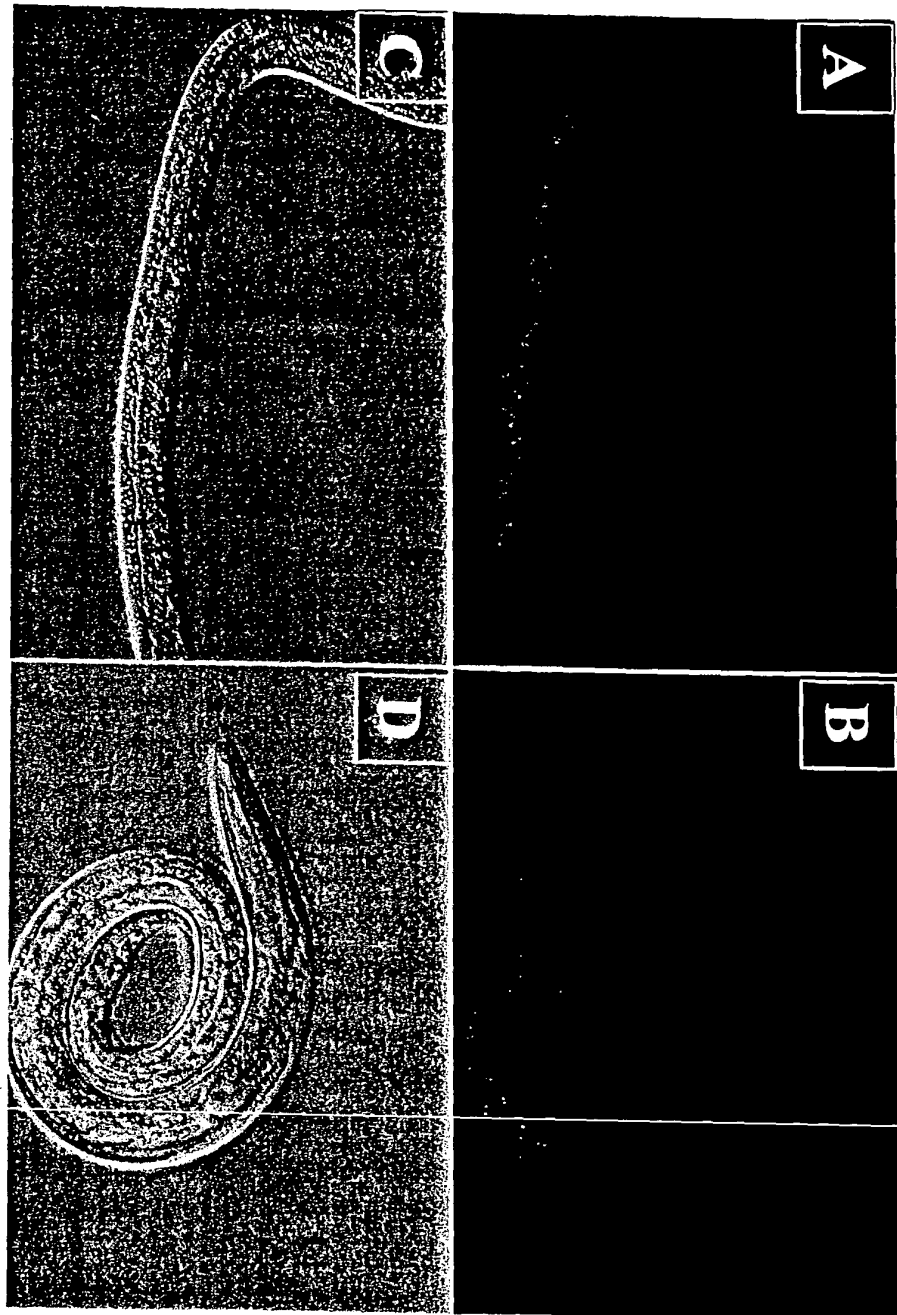
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FIGURES 6A-6D

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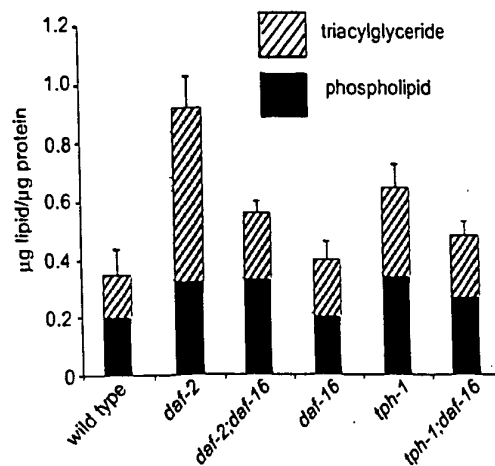
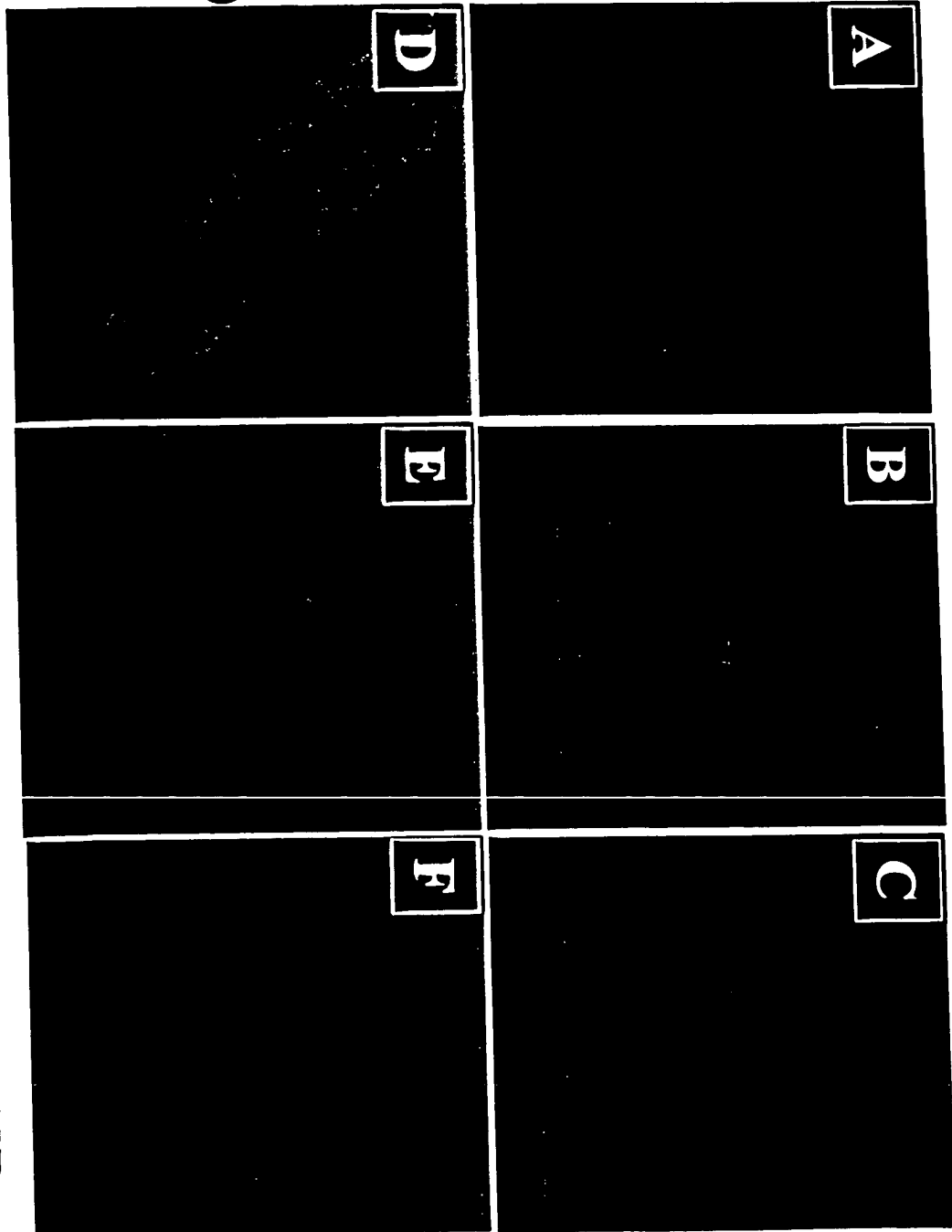


FIGURE 7

wild type

daf-2(e1370)



FIGURES 8A-8F

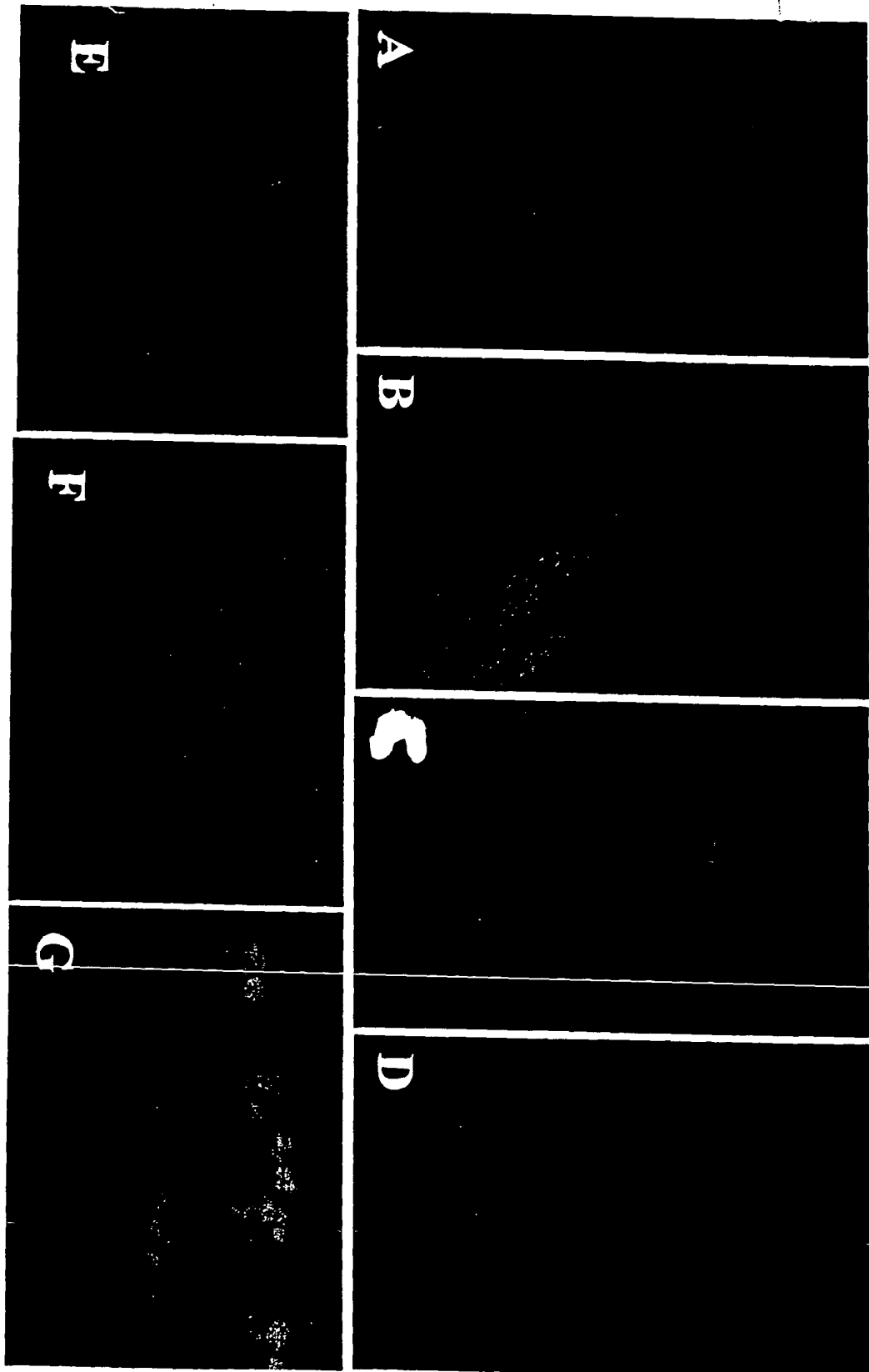
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FIGURES 9A-9G

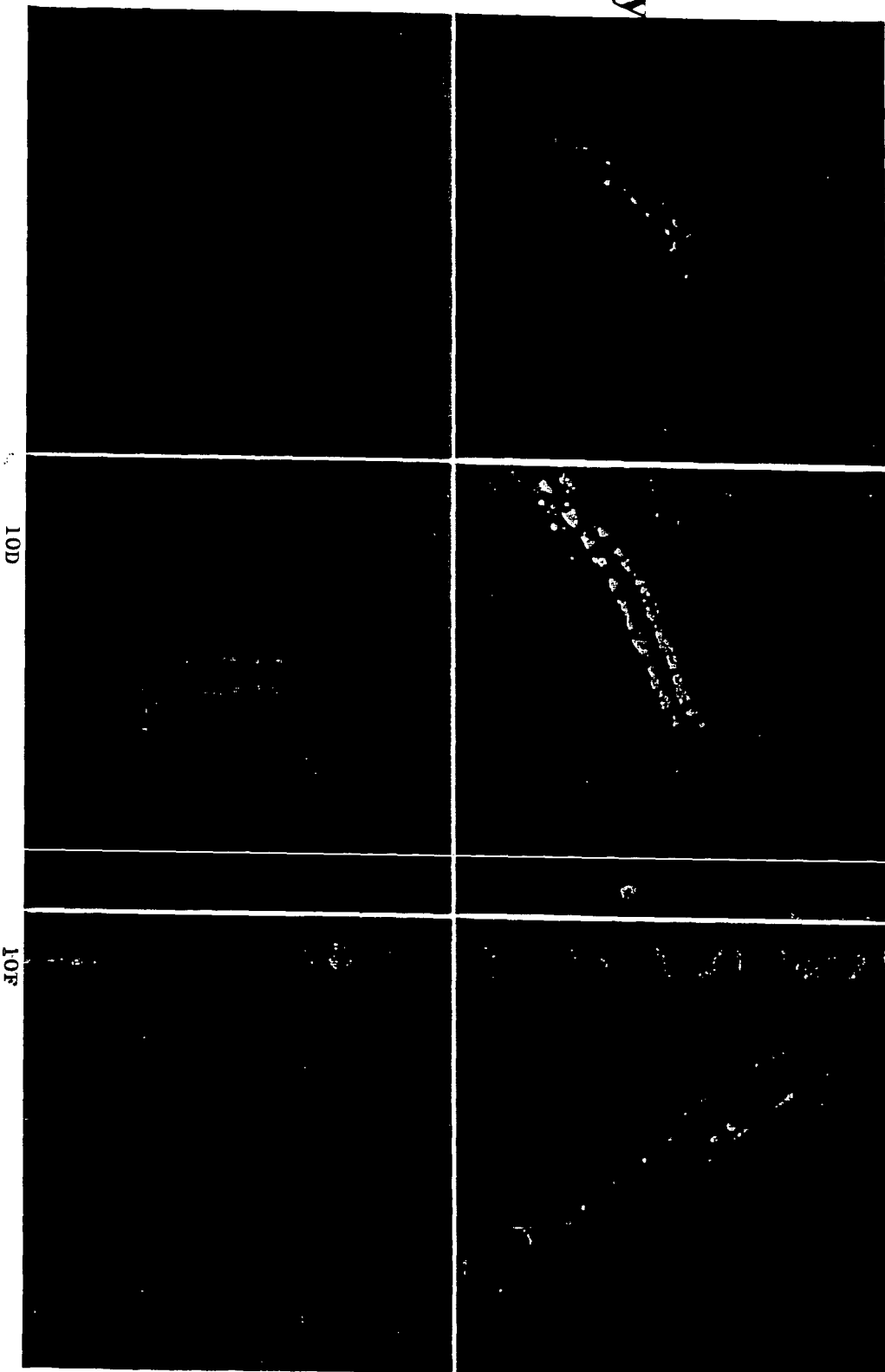
Nile red

10B

C12-bodipy

10A

wild type



FIGURES 10A-10F

lpo-1

lpo-2

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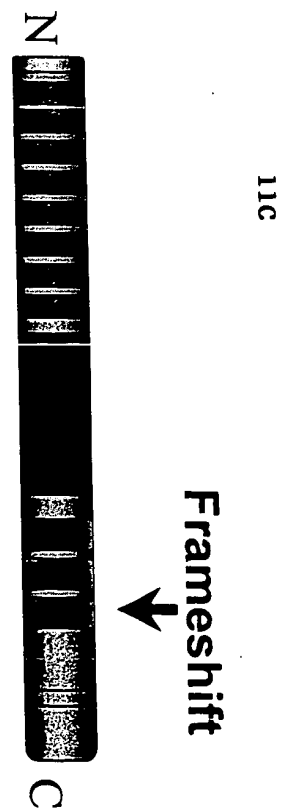
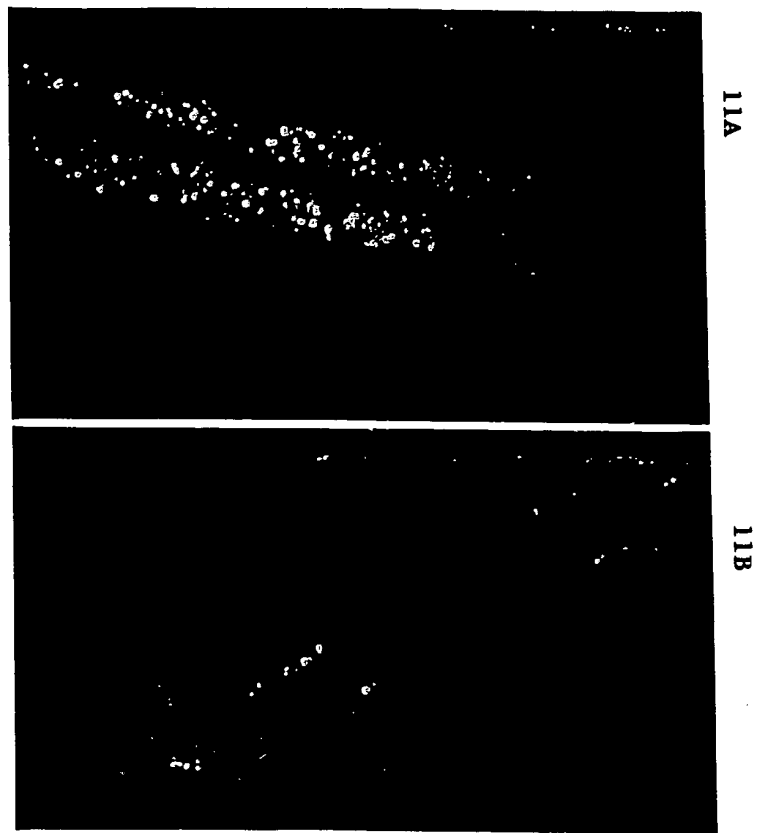
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FIGURES 11A-11C



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Figure 11 D

lpo-1 genomic

SEQ ID NO:1

```

5  agcctgttgc ctctgtcgaa gccgttttgt ctctctctcg tcgtcgtcga cccacccggc ctcccatgta
   gtgttcgttt tgcgctctat cgcacacaca cactctcggg aaacaacgac cacctcactc catctctatc
   cattctatcc tcttccatct ctacaggcca acggagacag ttcgttggac ccccgcgcac tctacctatc
   tgttcaacgc tccatattgtg caaagtctca gtcatttttc ctctgcttc ttcttctttt tattattaac
   tttttctcat cttatttctt ccactctttc gagagaccac tccgcccact ttctgttact gctttatcaa
10  acaaactgtg cgtccacacc aattctctat ttcccttcgt ctgctccggt ttcgctcact tttttgttaa
   ctatcttttc ttttttcttt taacatgttt attgatcctc accactgatc aattaatatt tattatttat
   ttctgtttcc agatcaccta cgaaaaatat taattgataa tcagaggagt aaaaATGAGG ACATGTCTCA
   CCTCACGGG TTTCTTCTG ATTTCAATGG CCACCATTC GGTGGGCTC CAACCGATGG GAGCACCTAC
   AAGAAgtatg ttttcttttt catttaaata tcacatagta attcaattga aaatcaatgc atttcggaat
15  ttcgcaacat tacttttgtt tggaccggtg agtcaccaat agatcaccta cgaaaaatat taattgataa
   tcagaggagt aaaaATGAGG ACATGTCTCA CCTCACGGG TTTCTTCTG ATTTCAATGG CCACCATTC
   GGTGGGCTC CAACCGATGG GAGCACCTAC AAGAAgtatg ttttcttttt catttaaata tcacatagta
   attcaattga aaatcaatgc atttcggaat ttcgcaacat tacttttgtt tggaccggtg agtcaccaat
   atcacgagat aataattttt tgcaacaatg caatttgttt tcagAATGCG ACGCAACAAA TTCGTTCCAG
   TGTCAAGATG GCCGATGCAT ACCGATGTCG TGGCGTTGTG ATGGAGATAT CGACTGCCAG AATGAAGAAG
20  ATGAGAAAAA TTGTCCAgt aaaactcttt ttcttaaaaa aacaatgata atttcaatga tagtttcagA
   AGTTTGTGGC GCCGAAGAAC ACAAATGCGG AGAAGTCAAA TCTGCTCGAT CATCGTTGGA AAGATTCAAG
   TGCATTCCGA ACAAATGGGT GTGTGATGGA GAATTCGACT GTGAAGATAA ATCGGACGAA TTCCAATGCA
   AAAgtatgtt caattgaatt caagacagtt ttctgcaat ttttcaatct tttcagACGT ATCATGCCAA
   GAAAAACAGT TTCAATGTGA AGAACTCTCT GGTGATTATA GTTTGTGCAT TCCTGAAACA TGGGTTTGCG
25  ATGGTCAAAG AGACTGTACG AATGGCAAAG ACGAACAGAA TTGCACGTCA AAAACGTCTA AATGTCCGGA
   TAACAACCTC CAgtaagtct ccatacaaat cttatcgcaa ttaaactctat cccgttgacc taattgtacc
   actctgacaa aattgagaaa aaagtgtttc atttttcagG TGTAGCAATG GAAATGTAT TTTCAAAAAC
   TGGGTTTGTG ATGGGGAAGA AGATTGCTCA GATGGCTCAG ATGAATTGCT CACTGCTCCA TCCAATTGTA
   ACCGAACAGT TAATCAATGC CCTCCCGGAG AAATGTGGAA Ggtatgagtg ttacggatc ttgagaaaaat
30  gtttatgctg agcatgttga aatatgtgtt tgtttctcga ttgtttagag ggtcaagtaa tcgagtgttg
   gctatgctag tgtcaaacca actgataata agtaaaatat attatattga taattcaatt aatatctatt
   tgtctcataa tatagacttt attaaataca taatacatat tagaaaagaa aaataattca ataagctgga
   gtaagaaatt atcattttca gtcttttctt tgtcaattga ttgtgtattg cagtcgattg ttatctgtta
   gtgaccattt ctcccccgca atcacgtctg ggaaattgat atgtatttct gaattaaaca attaaatttt
35  cagTGTGGAT CCGGTGAATG CATTCCATCA AGATGGCGAT GCGACGAGA AGTCGATTGC AAAGATCATT
   CCGATGAGAA GAATTGTACT GCTATTCAAC ACACGTGCAA GTTAGCAGAG gtaggatggg ggcaatatgc
   acctgcttga tgctaattgca acatggtcat taaaatatta gatgtcacc atattagata ggctaattgg
   gttttaaatc attaaatgat gagaaattta acaaccat tatagttcca aaatgcaata acttcagGAA
   TTCGCTTGTA AAGCTTCACA CAACTGCATC AACAAGGCTT TCGTATGTGA TGGAGAACTT GATTGTTCCG
40  ATGGATCCGA CGAAGATGAT TGTGCTGACG TTCGGACCGA GTGTAAATCC GGAGAGCGTA CCTGCCAGC
   TTCATACGGT GCATATGGCG CCGAGTCAGG TCACGTTGTG TGTATTCTCT CATCGTCATG GTGCAATGGA
   GAAGAGGATT GTCCAGATGG TGGTGATGAG AAAGAATGTA ATATGACTGC TCCTGgtaag taatattagc
   aaaagtgtt gaaatatatt cgttatattt tcagTCACAT GCCAGAAAGG AACCGAATAT GAATGTCCAT
   CTACTCCATT GCAATGTATT GAAATGTCAA AATTGTGTGC TAGTGCTCAA TTTGATTGTG GGGATGGAAA
45  TATGTCTGTT TGTAGCCAGA AAAAGATCAT TGgtaatata aatatttatt tatggtctgg caaatgctc
   ttcaattaca gAAATGTGCA AACCAAGTTC AGAAGATGAT GTCTGCCGTC CATCGTTTGT CCGAGGAAAT
   AATGTTTGTG ACTGTAAAGA TGGTTACAAA CTCGAAAACG GACAGTGCAT TGgtgagtaa ttggttagcaa
   gagagatggg ttagcgagaa acaaaatagt gaaaaagaca aagagatcct catcaaaatg tagaaaaata
   gttgagatgc gaagcgagca gctgaacaat cagcaatatg aaaacacagg aagtattttc taataacgaa
50  atgttttatt ttccagATATT AACGAATGTG AAATTGCTGG CGTTTGTGAT CAAATTTGTC TCAATATTCC
   CGGTTTCTAT CGTTGTGCTT GTCATGCTGG ATATCAGATT AGTTTCGGAG ATACTAAAAT TGGATCAGGA
   AGAATTGCTA ACAAATGTCG TGCTATGGGA GGTGATCCAT TGGTTCTTCT TACCAACAGA CATACGATCA
   GACAATTTGA TCTTGTCAAT AAAATGCACT TCCCTGTTTC CAGTAGTCCT GGTCTGCGG TTGCCATGGA
   TTTCCACATC TTGAACGGGg tgagttgaat tttttattac ggattgttat tatttacttg agaagaatac
55  caaaaaatct gattttaata taattttttc agACACTGAT TTGGTCTGAC GTGTTGTCAA AGCAAATTCT
   GAAATGTTTC ATTGGAAACG TGTCAAACGC ATTTTGGGA ACCGATATGT GCGATAAGAA GCATGAAATC
   GTTCTCACAG GAGACAAGAT TCATACTCCA GATGGACTTG CAGTTGATTG GGTTCATGAT CTCCTTTTCT

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GGACAGATGG AGGCCTTGAT CAAATTAATG TTCTCGATAT GAAAAATGGA AAGCAGCGTG TCCTTTATTC
TTCCGACTTG GAAGAACCGA GAGCTATTGC AGTTGATCCT GAAGTTGGAC TCATTTTCTG GACTGATTGG
GGAAAGAAGG CGAGAATCGA AAGATCTGGA ATGGATGGAC AACATCGTAC TGTTATTGTT GAGGGAGATC
GTGTTGTATG GCCGAATGGA TTGGCTTTGG ATTATGTTGA TAAGCGTGTC TATTGGCTGA TGCCAAGATC
5 AAGTCAATCT TCAGTTgtga ttattggggc aaaaatatca agaccgtatt gcattctcat caatatctaa
ggcatccatt ctcaatggct gttttcgaag accgactctt ctacacagat tgggagcatg atggtgttat
cactgttaac aaggatatgtt ttttaaaatg aaattttaac ttggaaaact ggttttttaa aacgaaattc
gctgaaaatt cgctggaacc atgaaacttt gaattattgaa gacaatttta atgaaaattg tctacacgaa
atgaatttag attaaaaaag attgctaata attttttttg taaatcaatc gcgctttcaa cttacgaaat
10 atttttcagT TCACTGGAGC TGATATTCTG ACTGTTATGG ATCAAGTGAA GTCTCCAATG ACTGTACGCA
TCTACCACAA ACAAGCACAA CCACTTATGC AGAACAAAGTG TGAAACTTCG GAATGTGATC ATCTCTGCCT
GCCGAGAGCC GTTTACCGTG AGAAAGAACG TGTCATGAA AAAACTTGGC ACGACAGACC GTTCTCGTGT
GCATGCGAAG GAACGACTGC TTCTGATGTT CTGGAATGTT TCGgtaggac aatcaattag gtatttagat
acttaacggt ttttaagttc agCTGACTTG GAAACAAAAT CCGGAATCTC GATGTTACAG ATTTTCCTTC
15 TTTTATGTGT TGGTGGAGTT GTGGCCGCTG GATTGTGAT TGTTTCGTCG AAGATGGGAC CTCGTACATT
TACCGCTCTC AATTTTGACA ATCCAATTTA TCGTCGAACC ACCGAAGAAG CTGATCATCA GATGGAAGAT
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cctataaatt tatttgcacc cttcccttat tgtacagatt gcccatthtc tcttctcatt tcatgtcact
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attcaccggg ttatcgagct ttttccaaat gtttttatgt agtatttcct cgttttttct actctgaagc
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tccctcccc ttcctctcat caacggattt attcaataaa
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Figure 11E

lpo-1 cDNA

SEQ ID NO:2

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5  atgaggacat gtctcaccct cacgggtttc cttctgattt caatggccac catttcggtg ggccccaac
   cgatgggagc acctacaaga aaatgcgacg caacaaattc gttccagtgt caagatggcc gatgcatacc
   gatgtcgtgg cgtttgtgat gagatatcga ctgccagaat gaagaagatg agaaaaattg tccaaaagtt
   tgtggcgccg aagaacacaa atgcggagaa Gtcaaactcg ctcgatcatc gttggaaaga ttcaagtga
   ttccgaacaa atgggtgtgt Gatggagaat tcgactgtga agataaatcg gacgaattcc aatgcaaaaa
   cgtatcatgc caagaaaaac agtttcaatg tgaagaactc tctggtgatt atagtttgtg cattcctgaa
10  acatgggttt gcgatgggtca aagagactgt acgaatggca aagacgaaca gaattgcacg tcaaaaacgt
   ctaaattgtc ggataacaac ttccagtgtg gcaatggaaa ttgtattttc aaaaactggg ttttgtatgg
   ggaagaagat tgctcagatg gctcagatga attgctcact gctccatcca attgtaaccg aacagttaat
   caatgccttc ccggagaaat gtggaagtgt ggatccggtg aatgcattcc atcaagatgg cgatgcgacg
   cagaagtcca ttgcaaagat cattccgatg agaagaattg tactgctatt caacacacgt gcaagtttagc
15  agaggaattc gcttgtaaag cttcacacaa ctgcatcaac aaggctttcg tatgtgatgg agaacttgat
   tgttccgatg gatccgacga agatgattgt gctgacgttc ggaccgagtg taaatccgga gagcgtacct
   gccagcttc atacgggtgc tatggcgccg agtcagggtca cgttggtgtg attcctgcat cgtcatggtg
   caatggagaa gaggattgtc cagatggtgg tgatgagaaa gaatgtaata tgactgctcc tgtcacatgc
   cagaaaggaa ccgaatatga atgtccatct actccattgc aatgtattga aatgtcaaaa ttgtgtgcta
20  gtgctcaatt tgatttgtgg gatggaataa tgtctgtttg tagccagaaa aagatcattg aaatgtgcaa
   accaagttca gaaggatgtg tctgccgtcc atcgtttgtc cgaggaaaata atgtttgtca ctgtaaagat
   gggtacaaac tcgaaaacgg acagtgcatt gatattaacg aatgtgaaat tgctggcgtt tgtgatcaaa
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   tggggaaaaga aggcgagaat cgaaagatct ggaatggatg gacaacatcg tactgttatt gttgaggag
   atcgtgttgt atggccgaat ggattggctt tggattatgt tgataagcgt gtctattggc tgatgccaag
   atcaagtcaa tcttcagttt tcactggagc tgatattcgt actgttatgg atcaagtga gctcctaag
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   gttctcgtgt gcatgcgaag gaacgactgc ttctgatgtt ctggaatgtt tcgctgactt ggaaacaaaa
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   ttgttcgtcg gaagatggga cctcgtacat ttaccgctct caattttgac aatccaattt atcgtcgaac
   caccgaagaa gctgatcatc agatggaaga tccattccgt gatccttttg ctgaaccacg gaatggaaga
40  gggcgtaacg atggattacc aactcttgca tctgctgaca atgaaacacg ggctgacgca ttgagcttct
   ga
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Figure 11F

LPO-1

SEQ ID NO:3

5 MRTCLTLTGF LLISMATISV GLQPMGAPTR KCDATNSFQC QDGRICIPMSW RCDGDIDCQN EEDEKNCPKV
CGAEHHCGE VKSARSSLER FKCIPNKWVC DGEFDCEDKS DEFQCKNVSC QEKQFQCEEL SGDYSLCIPE
TWVCDGQRDC TNGKDEQNCT SKTSKCPDNN FQCSNGNCIF KNWVCDGEED CSDGSDELLT APSNCNRTVN
QCPPGEMWKC GSGECIPSRW RCDAEVDCKD HSDEKNCTAI QHTCKLAEEF ACKASHNCIN KAFVCDGELD
CSDGSDEDDC ADVRTECKSG ERTCPASYGA YGAESGHVVC IPASSWCNGE EDCPDGGDEK ECNMTAPVTC
10 QKGTEYECPS TPLQCIEMSK LCASAQFDCG DGNMSVCSQK KIIEMCKPSS EGCVCPRPSFV RGNNVCHCKD
GYKLENGQCI DINECEIAGV CDQICLNIPG SYRCACHAGY QISFGDTKIG SGRIANKCRA MGGDPLVLLT
NRHTIRQFDL VNKMHPVSS SPGSAMVAMDF HILNGTLIWS DVLSKQILKC SIGNVSNAFL GTDMCDKKHE
IVLTGDKIHT PDGLAVDWHV DLLFWDGGL DQINVLDMMN GKQRVLYSSD LEEPRAIAVD PEVGLIFWTD
WGKKARIERS GMDGQHRTVI VEGDRVWPN GLALDYVDKR VYWLMPRSSQ SSVFTGADIR TVMDQVKSPM
TVRIYHKQAQ PLMQNKCENS ECDHLCLPRA VYREKERVHE KTWHDRPFSC ACEGTTASDV LECFADLET
15 SGISMFTIFL LLCVGGVVA GFVIVRRKMG PRTFTALNFD NPIYRRTTEE ADHQMEDPFR DPFAEPRNGR
GRNDGLPTLA SADNETRADA LSF

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Figure 11G

5	RAT human lpo-1	MGTSARWALWLLALCWAPRDSGATASGKKAKCDSSQFQCTNGRCITLLWKCDGDEDCTD 60 MGTSALWALWLLALCWAPRESGATGTGRKAKCEPSQFQCTNGRCITLLWKCDGDEDCTD 60 MRTCLTLTGFLISMATISVGLQPMGAPTRKCDATNSFQCQDGRICIPMSWRCDGDIDCQN 60 * * . : : * : : . . . : : . . . * : : * : : * : : * : : *	(SEQ ID NO:10) (SEQ ID NO:9) (SEQ ID NO:3)
10	RAT human lpo-1	GSDEKNCVKKTCAESDFVCKNG-----QCVPNRWQCDGDPDCEDGSDSPEQCHMR 111 GSDEKNCVKKTCAESDFVCNNG-----QCVPSRWKCDGDPDCEDGSDSPEQCHMR 111 EEDKNCVKVCGAEHKKCEVKSARSSLERFKCIPNKWVCDGEFDCEDKSDE--FQCKNV 118 . * : : * : : . . : : : . : * : : * : : * : : * : : *	
15	RAT human lpo-1	TCRINEISCGARS---TQCI PESWRCDGENDCDNGEENCGNIT--CSADEFTCSSGRG 166 TCRIHEISCGAHS---TQCI PVSWRCDGENDCDSGEENCGNIT--CSPDEFTCSSGRG 166 SCQEKQFQCEELSGDYSLCIPETWVCDGQRDCTNGKDEQNCTSKTQCPDNFQCSNGNC 178 : * : : : * . . : : * : * : : * : : * : : * : : * : : * : : *	
20	RAT human lpo-1	VSRNFVNCNGQDDCDDGSDDELDCAPPTCG-----AHEFQCRTSSCIPLSWVCDDDADC 218 ISRNFCVNCNGQDDCSDGSDDELDCAPPTCG-----AHEFQCTSSCIPISWVCDDDADC 218 IFKNWVCDGEEDCSDGSDDELTLTAPSNCRNRTVNQCIPGEMWKCISGECIPSRWRCDAEVDC 238 : : * : : * : : * : : * : : * : : * : : * : : * : : * : : *	
25	RAT human lpo-1	SDQSDLESLEQCGRQPVHTKCPSEIQCGSGE-CIHKKWRCDGDPDCCKDGSDEVNCPSPR- 276 SDQSDLESLEQCGRQPVHTKCPASEIQCGSGE-CIHKKWRCDGDPDCCKDGSDEVNCPSPR- 276 KDHSDE---KNCTAIQHTCKLAEEFACKASHNCINKAFVCDGELDCSDGSDDEDDCADVR 294 . * : : * . . : : * : : * : : * : : * : : * : : * : : *	
30	RAT human lpo-1	-TCRPDQFECEDGS-----CIHGRQCNGIRDVCVDSDEVNCKNVN--QCLGPG 322 -TCRPDQFECEDGS-----CIHGRQCNGIRDVCVDSDEVNCKNVN--QCLGPG 322 TECKSGERTCPASYGAYGAESGHVVCIPASSWCNGEEDCPDGGDEKECNMTAPVTCQKGT 354 : * : : : * . . : : : . . * : : * : : * : : * : : * : : *	
35	RAT human lpo-1	KFKCRSG--ECIDITKVCQD-QEQDCRDWSDEPLKECHINECLVNNGGCSHICKDLVIG-Y 378 KFKCRSG--ECIDISKVCN-QEQDCRDWSDEPLKECHINECLVNNGGCSHICKDLVIG-Y 378 EYECPSSTPLQCIEMSKLCAQFDCGDNMSVCSQKKIEMCKPSSEGCVCPRSPFVRGN 414 : : * * . : : * : : * : : * : : * : : * : : * : : * : : *	
40	RAT human lpo-1	ECDCAAGFELIDRKTCDGIDECQNPICISQICINLKGKYKCECSRQYQMDLATG----- 432 ECDCAAGFELIDRKTCDGIDECQNPICISQICINLKGKYKCECSRQYQMDLATG----- 432 VCHCKDGYKLEN-GQCIDINECEIAGVCDQICLNIPGSYRCACHAGYQISFGDTKIGSGR 473 * . * : : * : : * : : * : : * : : * : : * : : * : : *	
45	RAT human lpo-1	---VCKAVGKEPSLIFTNRDIRKIGLERKEYIQLVEQLRNTVALDADIAAQKLFWADLS 489 ---VCKAVGKEPSLIFTNRDIRKIGLERKEYIQLVEQLRNTVALDADIAAQKLFWADLS 489 IANKCRAMGGDPLVLLTNRHTIRQFDLVNKMHPVSSSPGSAMVDFHILNGTLIWSVDL 533 : . * : : * : : * : : * : : * : : * : : * : : * : : *	
50	RAT human lpo-1	QKAIFSASID-----DKVGRHVKMIDNVNPAIAVWDVYKTIYWTDAASKTI 537 QKAIFSASID-----DKVGRHVKMIDNVNPAIAVWDVYKTIYWTDAASKTI 537 SKQILKCSIGNVSNFLGTDMCDKKHEIVLTGDKIHTPDGLAVDWVHDLFWTDGGLDQI 593 . * * : : * : : . . : : * : : . . * : : * : : * : : * : : *	
55	RAT human lpo-1	SVATLDGTGTRKFLFNSDLREPASIAVDPLSGFVYWSWGEPAKIEKAGMNGFDRRPLVTE 597 SVATLDGTGTRKFLFNSDLREPASIAVDPLSGFVYWSWGEPAKIEKAGMNGFDRRPLVTA 597 NVLDKMGKQVRVLYSSDLEEPRAIADPEVGLIFWTDWGGKARIERSGMDGQHRVTIVEG 653 . * : . . * : : * : : * : : * : : * : : * : : * : : * : : *	
60	RAT human lpo-1	D-IQWPNGITLDLVKSRLYLWDSKLHMLSSVDLNGQDRRIVLKSLEFLAHLPLALTIFEDR 656 D-IQWPNGITLDLKSRLYLWDSKLHMLSSVDLNGQDRRIVLKSLEFLAHLPLALTIFEDR 656 DRVVWPNGLALDYVDKRVYWLMPRSSQSS----- 682 * : * : : * : : * : : * : : *	
65	RAT human lpo-1	VYWIDGENEAVYGANKFTGSELATLVNNDLQAQDIIYHELVPQSGKNWCEEDMENGGE 716 VYWIDGENEAVYGANKFTGSELATLVNNDLQAQDIIYHELVPQSGKNWCEEDMENGGE 716 -----VFTGADIRTVMDQVKSPMTVRIYHKQAQPLMKNKCENSE----CD 723 * : : : * : : * : : * : : * : : * : : *	
70	RAT human lpo-1	YLCLPAPQINDHSPKYTCSCPNNGYNLEENGRCQSTSTPTVYSETKDVTNTDILRTSGLV 776 YLCLPAPQINDHSPKYTCSCPNNGYNVEENGRDCQSTATTVTYSETKDVTNTTEISATSGLV 776 HLCLPRAVYREKE-----RVHEKTWDRPFSCACEGTTASDVLECFADLETG 770	

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:***** : : : : * . . . :

5 RAT PGGINVTAVSEVSVPPKGTSAAWAILPLLLLVMAAVGGYLMWRNWQHKNMKS MNFDNPV 836
 human PGGINVTAVSEVSVPPKGTSAAWAILPLLLLVMAAVGGYLMWRNWQHKNMKS MNFDNPV 836
 lpo-1 SG-----ISMFTIFLLLCVGGVVAAGFVIVRRKMGPRFTALNFDNPI 813
 . * * : * * : : . * . * : : * : : . . . : ***** :

10 RAT YLKTTEEDLSIDIG-----RHSASVGHTYPAISVVSTDDDLA---- 873
 human YLKTTEEDLSIDIG-----RHSASVGHTYPAISVVSTDDDLA---- 873
 lpo-1 YRRTTEADHQMEDPFRDPFAEPRNGRNDGLPTLASADNETRADALSF 863
 * :

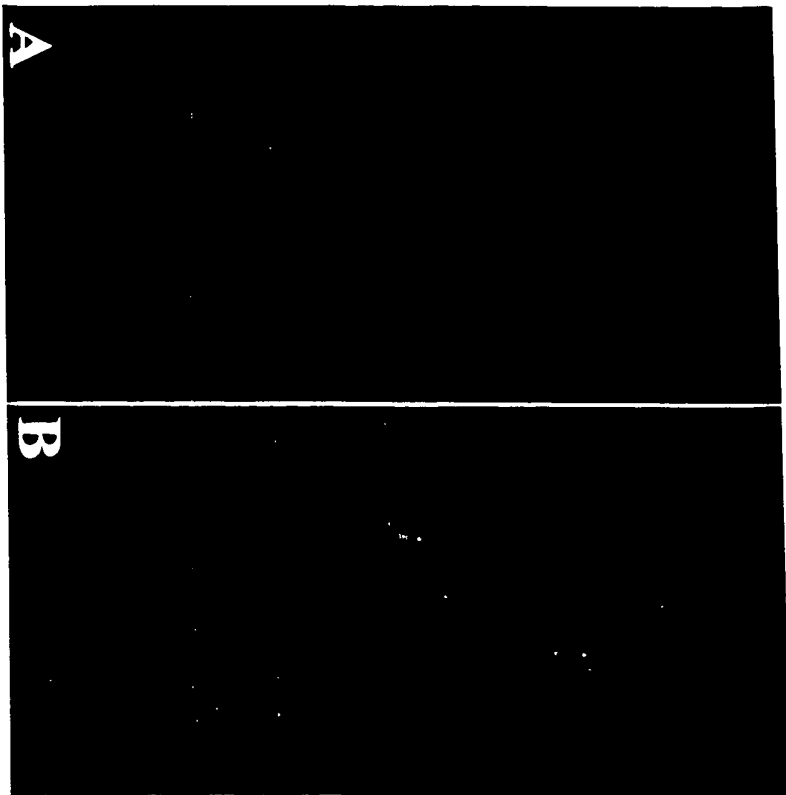
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FIGURES 12A-12C



12C

■ ABC transporter region
| transmembrane region

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Figure 12D

LPO-3 Unspliced DNA (7496 bp)

SEQ ID NO:4

```

5  tctccacttt caactggtca gagacgtcgt ctttaacatc ttccccgtcg tcttccgcct aaaaaagtgc
   gaaaagaaac atcaacagaa aacaatgaat tgatcactac aattatataa atttgctttt cttcctatca
   catatcactt cgtctgtctg cgtctctatc acttttattat cttcaatata ccacattatc tcggttggcc
   tggaaacctt tcagtcggtt tttcttaaaa ctattcatcg tcagcaacct cgtcatctta aaaaattaga
   aaaattggaa gaaaaaagag aaataaaaaa ggggtggagc ctagacacct tcaacacata tttttaatta
   aagacgccct tttttcgga gacctttctc tccgctttcc cccattattt ttctattatt atctaactg
10  ATGAAAAGCC GAAAAACGA GCCACTTGG GTGACTAAGC CTCTGCTTAA ACGgtatgag ttgtcaagag
   attctctgaa aaaaacctaa aatttttgaa tattcaaaac agataatttc agattctagt aatttggat
   aattccaaaa taaaaatat aaacatttta cagCTCTCAT TCAAGTGACT CTTCAATCGA TGAATCAACT
   GTTAAACTCA CAAATTATGG GATATTCTAT TACACTCAAG GAGTTGATCT ACTTCTTTTA ATTACTGGAA
   CAGTTGCAGC AGTTATTCAT GGAGCTGGTT TTCCGTTACT TGCTATTGgt atgtggtttt attttttaat
15  ttgaatgata aatcaaaagc tgaaattatc atttgaaacg tcaactacat ataattttat aaaatgttat
   tatgagaact catagtcaga attaatTTTT tttttgaaaa atttagtaaa ctctaatacta cgttcaacat
   tcacaaaatg acctccgata tcgtcatcca atccaataaa ctactcgcac taccatttaa ctttaattaga
   tcaaaatgtt catgacatca tttgaactag agaaaaaaag tgatttgtgt tgtggttttg aactatggaa
   ttggaggctt tttatattct tcaaaaaagg aaaatgtgtt aagttgaaat ttatcagctc cttaaaacaa
20  attcgaaata catgagatat cataggctga aaattgtgat atttaataat tgcattagggt tgtatttaaa
   aatttaaaaa atacactaac taagaagtcg aacagattca aatatcataa ctaaacaatc aaaaaatttc
   tatagaaaat gtggactttt tgagaatttt gagaattttt gcgggtttga agtcaagttt ccgaaaacaa
   aataattaaa atataaaact cgtagaatat gtatttttag ttgacttcca aaattatgat aaatcaaaaa
   taagggattg gcactttttc gactgttgat aagaaatttc aaataatgtt tgaaaattta cattttgggtc
25  atttaaaaaat gttatacaaa tgagtggttt taaataactt tctccattaa cgaacattct tggccccgca
   gtaaaatcaa ttagatagtt aaaagcagaa acgatgattt caaagttctc gtatttgcag TTCTCGGAGG
   AATGACAACA GTGTTTTTAC GAGCTCAAAA CTCGGATTTC GTCGTTGGTG TGGATAATGT GAACCCGGAA
   GGATTGGTCC CGATATCTCT gtacgttttt tttagaactt tgacttttac tttttatgat cctgcaaatt
   tttgtatttg tatctttttg actagtcaat ctgcgcgaaa tgataaggct atccaaaaca gctgggtgtg
30  cttttgacac cttttctagt tccttgtgaa tgaacacata aatattatat tacacttttt tacaatacaa
   aaaaccttcc aatctgtttt ctttttttagA GATGAATTCA ACTCGGAAGT TGTCAGTAT TGTATCTACT
   ACCTGGTTCT TGGTGTACTC ATGTTCTTCA CTTCATATGT ACAAATCGCT TGTTTTGAGT CGTACGCAGA
   GAGATTGGTG CATAAATTAA GACAAACTA CCTGAAAGCC ATACTCAGAC AACAAATTCA ATGGTTCGAC
   AAACAACAGA CCGGAAATTT AACGGCTAGA CTCACGGAgg aagttaagaa gtacattttt tgaagaatga
35  tagagaagtg agacatgtta tatacatata atgagctttt gccgttcgtc aaatttttct agaaattcat
   cttaaattccc ggaagatcac taaagatatt gcaaataata aatcatcggt aatcttttta ttgcagCGAT
   TTGGAGCGTG TCCGTGAAGG ATTAGGTGAC AAATTCGCCC TTCTTGTTCA AATGTTTGCT GCTTCTTG
   CTGGATACGG AGTTGGCTTC TTTTATAGTT GGTCAATGAC ACTGGTTATG ATGGGATTG CTCCGTTGAT
   TGTGCTCTCT GTTGCCAAAA TGAGCAAAAG CATGGCAACG CGAACAAGAG TTGAACAAGA AACGTATGCA
40  GTCGCTGGTG CAATTGCAGA AGAAACATTC TCTTCGATTA GAACAGTTCA TTCATTAAAT GGACATAAAA
   GAGAATTGGA TAGATTTTAT AACGCATTGG AAGTTGGAAG ACAAAGTTGA ATTGTTAAAT ATTGTTATAT
   GGGTATTGGA GTTGGGTTCA GTAATTTGTG TATGTACTCT TCATATGCAT TGGCATTTTG GTATGGAAGT
   ACTCTGATTA TCAATGATCC TACTTTTGAT CGCGGTCTTA TTTTACGgt tagtcatttt tcaattcaaa
   aattcatgct tataaagcag tcatttaaaa tattaagag agagtaccgt ttctgtcccc aaactcaaaa
45  tgtcttcaaa atttttattg aaaaagggtc tgattttaag ctacaatctc cattttttgc aagtattaat
   ttcttattat taaaaacaag tgaacaattc taattttcag GTTTTCTTCG CAGTCTCTC GGGTCTTACA
   TCTCTCGGTG GCGCCTTCC ACATCTTGCA AGTTTTGGAA CAGCTCGCG AGCAGCTTCA ACAGTATTAC
   GTGTAATCAA CTCGCACCCA AAAATCGATC CATATTCACT TGAAGGAATT CTCGTGGACA ATATGAAGGG
   AGATATTTCA TTCAAAGATG TTCATTCCG ATATCCATCT CGAAAAGATA TTCATGTATT AAAAGGAATT
50  TCTCTGGAAC TGAAAGCTGG TGATAAAATT GCTTTGGTCG GTTCAAGTGG TTGTGGAATA TCAACAATTG
   TTAATTTACT TCAAAGATTC TATGATCCAA CAAAAGGAAG AGTTTTAATT GATGGAGTTG ATTTACGAGA
   AGTAAATGTT CATAGTCTTC GTGAACAAAT TGGAATTGTT AGTCAAGAGC CAGTACTTTT CGATGGAACA
   ATTTATGAAA ATATTAAAAT GGGAAATGAG CATGCTACTC ATGATCAAGT CGTTGAAGCG TGTAATATGG
   CAAATGCAAA TGATTTTATC AAAAGATTGC CTGATGGATA TGGAACAAGA GTTGGAGAAA AAGGAGTTCA
55  ATTAAGTGGA GGACAGAAAC AAAGAATTGg ttagttattc agttgaaaca tctaaaattg gaaaagatcc
   tttagaagtt cactcgaaat tcaaaaatac gaaagtcac gtttaaat taaaaaaat tacaatttta
   catatatttc atattccagC CATTGCACGT GCTCTGTCA AAAATCCAAA AATCCTTTTG CTCGACGAAG

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	CCACATCCGC	TCTCGACACG	GAAGCTGAGA	GAGAAGTTCA	AGGTGCATTG	GATCAGGCAC	AAGCTGGAAG
	AACGACAATT	ATCGTAGCTC	ACCGATTGAG	CACAATTGCA	AATGTTGACA	GAATATTCGT	GTTCAAAGCT
	GGAAATATTG	TTGAATCTGG	AAGTCATGAG	GAATTAATGA	GCAAACAAGG	AATCTTCTAC	GATATGACAC
	AGGCTCAAGT	TGTTGACAAA	CAGCAACAGG	AAGCAGGAAA	AGgtaattct	aatgttttaag	gaaaactaat
5	atagattaaa	tttcagATAT	TGAAGACACT	ATTTCTGAGT	CAGCTCATTG	CCATCTCAGC	AGAAAGTCTT
	CCACAAGAAG	TGCCATTTCA	ATTGCAACAT	CTATTCATCA	GCTCGCTGAG	GAGGTTGAGg	tacgaaaata
	attacttatt	tcttttggtt	tttgaagggtg	gagtatcgtc	agtggggatt	tactacatgc	ataatagtca
	cacttgacca	aatataaaac	ctctacaaat	ttttagatat	tccattttga	gattaagaga	gttttgataa
	attggcaaat	gtttgaaaaa	ttgggctttt	caaagaaatt	taagcaatgc	cgcatgttcg	atcttctaca
10	acggttatat	acaaattatc	aaaaaacaca	attaaaatgt	gaaactggta	gagaaaaaat	ttttagtcca
	cttccaaaat	tatgagttgc	gaaacctgag	gaatttcaac	ttattgactg	taaaaaatta	atataatttt
	tgaaaaat	taaaaagcta	ttcagatatt	tgaccataat	atgtaggtgt	aattctctta	ctggcgctac
	tccatccttt	aaaaataaat	attcaaaaat	gtgttcttta	actgaaatcc	atttcaacta	aatccaaaaa
	caattatagt	tattcccaaa	atattccagc	taattgaccc	attcaatggt	caaacgaatc	aagatgtgat
15	aagatctcgt	attttatcag	catttggggg	tgtaagtgat	agatgaatat	attcggtttt	caatgtttca
	tttcaacttc	tctcctttct	ctgattcttc	cttacatttt	cttcaaacac	ggcttcttct	aagtacttat
	cagcatgctt	ttatatgtgt	tttttggttc	aatgatcaat	tttttttaaa	tttttcctaa	tttaacaaaa
	taactttcag	GAATGCAAGG	CTCCACCCAC	CTCAATGTTT	AAAATATTCA	AATTCAACGG	AGACAAAGTC
	GGATGGTTTA	TTGGTGGAAT	TTTTGGAGCA	TTTATTTTTG	GATCAGTTAC	TCCAGTTTTT	GCTCTGTAT
20	ATGCTGAAAT	TTTCAATgta	attttttaga	aatattaaag	tagaagtaaa	actgtacatt	tttcagGTAT
	ACTCTTTGCC	AGCTGATCAA	ATGCAAGCAA	ATGTGTATTT	CTGGTGTGGA	ATGTTTGTTT	TTATGGGAAT
	CACTTTCTTC	GTTGGATTCT	TCACTTCTGC	AAATTGCCTC	GGACGATGTG	GAGAGTCACT	GACAAATGAAG
	TTGAGATTTG	AAGCATTCAA	GAATTTATTA	AGACAAGATA	TCGCTTTTTA	TGATGATTTG	AGACATGGAA
	CTGGAATAAT	GTGCACAAGA	TTTGCAACTG	ATGCTCCGAA	TGTTGATAT	GTATTCACAA	GACTTCCAGT
25	TGTTTTAGCA	TCAATTGTGA	CTATTTGTGG	AGCTCTGGGA	ATTGGATTCT	ATTACGGATG	GCAACTTGCC
	TTGATTCTTG	TCGTAATGGT	TCCACTACTT	GTAATGGGAG	GATATTTGCA	AATGCAAATG	AGATTTGGA
	AACAAATAAG	AGATACTCAA	TTGTTGGAAG	AAGCTGGA	AGTAGCTTCA	CAGGCTGTTG	AACACATTCG
	AACACTTCAAT	AGTTTAAATC	GTCAGGAACA	ATTTCATTTT	ACATACTGTG	AATATCTTCG	GGAACCATTC
	AATACTAATC	TGAAACATGC	ACATACATAT	GGAGCTGTAT	TTGCATTCTC	TCAATCTCTT	ATTTTCTTCA
30	TGTATGCTGC	TGCATTCTAT	CTTGGAAGTA	TTTTGTGAAA	TCAACAAGCT	ATGCAACCAA	TTGATGTCTA
	TCGAGTATTC	TTTGCTATTT	CATTCTGTGG	ACAAATGATT	GGAAATACTA	CATCTTTTAT	TCCTGATGTC
	GTAAAAGCTC	GTCTTGCTGC	TTCTCTTTTG	TTCTATCTTA	TTGAACATCC	AACACCTATT	GATTCTCTAT
	CTGATAGTGG	AATTGTGAAG	CCGATAACTG	GAAATATTTT	AATCAGAAAT	GTATTTTTCA	ATTATCCAAC
	AAGAAAGGAT	ACCAAGGTTT	TACAAGGATT	CACTCTTGAT	gtaggtttta	atgtgatacc	tgacttctat
35	atgacagtag	tgcaatccta	gggtaaaaag	caataagcct	tgacttttaa	aaactggata	tggatttttt
	ttgctgtttt	gtatcgatg	tttatgcact	tgccctctga	cttttttact	gaaattttta	aaataggaaa
	aaaaaaaaag	acaatgatcc	tacaattctt	aaccacctg	taaaaaacaa	tattaatata	tttatttttag
	ATCAAAGCCG	GTAATACTGT	TGCACTTGTC	GGGCACTCAG	GATGTGGA	ATCTACAATT	ATGGGACTGC
	TGGAGAGATT	CTATAATCAA	GATAAAGGAA	TGATTgtgag	tcaattttct	ttctgattgg	ttttaactgc
40	aaacaatttt	agATGATTGA	TGGTGATAAC	ATCCGTAACC	TAAACATCAG	TTCACTTCGC	GAACAAGTAT
	GTATTGTAAG	TCAAGAGCCA	ACGTTGTTTG	ATTGCACAAT	TGGAGAAAAT	ATTTGCTACG	GAACAATTCG
	AAATGTTACA	TATCAAGAAA	TTGTTGAAGC	TGCCAAAATG	GCAAATATTC	ACAATTTTCT	TCTAGGATTG
	CCAGATgtag	ggtgatattt	tcataaatca	gaactcattc	taaaaaattt	agGGTTATGA	TACTCATGTC
	GGAGAGAAA	GAATCAACT	TTCGGGTGGT	CAAAAACAAA	GAATTGCCAT	TGCACGGGCA	CTTGTTTCGAT
45	CTCCTTCTGT	TTACTTTTGT	GATGAAGCAA	CTAGTGCAAT	AGATACGGAA	AGTGAAAAGg	tttgtatgaa
	aaatattgaa	atagcaaat	gactttgaag	aatatcggtt	tattcactgt	ttacagATTG	TACAAGAAGC
	ATTGGACGCC	GCAAAAACAAG	GTCGCACGTG	TCTTGTCATT	GCTCATCGGT	TGAGCACAAT	TCAAATAGT
	GACGTCATTG	CGATCGTCAG	TGAGGGTAAA	ATTGTGGA	AGGGAACACA	TGACGAGTTG	ATAAGGAAGA
	GTGAAATATA	TCAGAAATTC	TGTGAAACGC	AGAGGATTGT	CGAAAGTCAA	TAAAtttaaat	atgtattaga
50	ttctcaaaca	cgagttttaca	aactaatgtg	catggagttt	cattttttta	atgtttcaatt	gaaacagctt
	gatattttaaa	attttaaatat	gctcatcaag	taaaattttt	agaaaatttt	gtaaacccgt	aataattttt
	ttgtcatcta	ggtacttttgc	tttttcccca	aatagccttt	ccctccatct	tgtgtatttt	gtgtgaaatt
	ctttgaattg	tgataattat	ctttgaattg	tgataattgt	ctttttggtt	tcttttttaa	atatattatt
55	taccat						

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Figure 12E

lpo-3

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SEQ ID NO:5

```
5 atgaaaagcc gaaaaaacga gccacttgg gtgactaagc ctctgcttaa acgctctcat tcaagtgact
  cttcaatcga tgaatcaact gttaaactca caaattatgg gatattctat tacactcaag gagttgatct
  acttctttta attactggaa cagttgcagc agttattcat ggagctggtt ttccggtact tgctattggt
  ctcggaggaa tgacaacagt gtttttacga gctcaaaact cggatttcgt cggttggtgtg gataatgtga
  acccggaagg attggtcccg atatctctag atgaattcaa ctcggaagtt gtcaagtatt gtatctacta
10 cctggttctt ggtgtactca tgttcttcac ttcatatgta caaatcgctt gttttgagtc gtacgcagag
  agattggtgc ataaattaag acaaaactac ctgaaagcca tactcagaca acaaatcaa tggttcgaca
  aacaacagac cggaaattta acggtagac tcacggacga tttggagcgt gtccgtgaag gattaggtga
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  tggccaatga cactggttat gatgggattt gctccgttga ttgtgctctc tggtgccaaa atgagcaaaa
  gcatggcaac gcgaacaaga gttgaacaag aaacgtatgc agtcgctggt gcaattgcag aagaaacatt
15 ctcttcgatt agaacagttc attcattaaa tggacataaa agagaattgg atagatttta taacgcattg
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  tcgcggtctt atttttacgg ttttcttcgc agttctctcg ggttctacat ctctcggtgg cgcccttcca
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  tgaacaaatt ggaattgtta gtcaagagcc agtacttttc gatggaacaa tttatgaaaa tattaaaatg
25 ggaaatgagc atgctactca tgatcaagtc gttgaagcgt gtaaaatggc aaatgcaaat gattttatca
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  tgttcttatg ggaatcactt tcttcgttgg attcttctact tctgcaaatt gcctcgagc atgtggagag
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  atttgagaca tggaaactgga aaattgtgca caagatttgc aactgatgct ccgaatgttc gatatgtatt
  cacaagactt ccagttgttt tagcatcaat tgtgactatt tgtggagctc tgggaattgg attctattac
40 ggatggcaac ttgccttgat tcttgctgta atggttccac tacttgtaat gggaggatat ttcgaaatgc
  aaatgagatt tggaaaacaa ataagagata ctcaattgtt ggaagaagct ggaaaagtag cttcacaggc
  tgttgaacac attcgaacag ttcatagttt aaatcgctcag gaacaatttc atttcacata ctgtgaatai
  cttcgggaac cattcaatac taatctgaaa catgcacata catatggagc tgtatttgca ttctctcaat
  ctcttatttt cttcatgtat gctgctgcat tctatcttgg aagtattttt gtaaatcaac aagctatgca
45 accaattgat gtctatcgag tattctttgc tatttcattc tgtggacaaa tgattggaaa tactacatct
  tttattcctg atgtcgtaaa agctcgtctt gctgcttctc ttttgttcta tcttattgaa catccaacac
  ctattgatct tctatctgat agtggaaatt tgaagccgat aactggaaat atttcaatca gaaatgtatt
  tttcaattat ccaacaagaa aggataccaa ggttttacaa ggattcactc ttgatataca agccggtaaa
  actgttgcac ttgtcgggca ctcaggatgt ggaaaatcta caattatggg actgctggag agattctata
50 atcaagataa aggaatgatt atgattgatg gtgataacat ccgtaaccta aacatcagtt cacttcgcga
  acaagtatgt attgtaagtc aagagccaac gttgtttgat tgcacaattg gagaaaatat ttgtacgga
  acaaatcgaa atgttacata tcaagaaatt gttgaagctg ccaaaatggc aaatattcac aatttcattc
  taggattgcc agatggttat gatactcatg tcggagagaa aggaactcaa ctttcgggtg gtcaaaaaca
  aagaattgcc attgcacggg cacttggtcg atctccttct gttttacttt tggatgaagc aactagtgca
55 ttagatacgg aaagtgaaaa gattgtacaa gaagcattgg acgccgcaa acaaggctgc acgtgtcttg
  tcattgctca tcggttgagc acaattcaaa atagtacgt cattgcgac gtcagtgagg gtaaaattgt
```

Title: POLYNUCLEOTIDE AND POLYPEPTIDE FAT
METABOLISM REGULATORS AND USES THEREOF

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ggaaaagggg acacatgacg agttgataag gaagagtga atatacaga aattctgtga aacgcagagg
attgtcgaaa gtcaataa

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Figure 12F

LPO-3

SEQ ID NO:6

	MKSRKNEPTW	VTKPLLKRSH	SSDSSIDEST	VKLTYNYGIFY	YTQGVDLLLL	ITGTVAAVIH	GAGFPLLAIV
5	LGGMTTVFLR	AQNSDFVGV	DNVNPEGLVP	ISLDEFNSEV	VKYCIYYLVL	GVLMMFFTSYV	QIACFESYAE
	RLVHKLRQNY	LKAILRQQIQ	WFDKQQTGNL	TARLTDDLRL	VREGLGDKFA	LLVQMFAAFL	AGYGVGFFYS
	WSMTLVMMGF	APLIVLSGAK	MSKSMATRTR	VEQETYAVAG	AIAEETFSSI	RTVHSLNGHK	RELDRFYNAL
	EVGRQTGIVK	YCYMGIGVGF	SNLCMYSSYA	LAFWYGSTLI	INDPTFDRGL	IFTVFFAVLS	GSTSLGGALP
	HLASFGTARG	AASTVLRVIN	SHPKIDPYSL	EGILVDNMKG	DISFKDVHFR	YPSRKDIHVL	KGISLELKAG
10	DKIALVGSSG	CGKSTIVNLL	QRFYDPTKGR	VLIDGVDLRE	VNVHSLREI	GIVSQEPVLF	DGTIYENIKM
	GNEHATHDQV	VEACKMANAN	DFIKRLPDGY	GTRVGEKGVQ	LSGGQKQRIA	IARALVKNPK	ILLLDEATSA
	LDTEAEREVQ	GALDQAQAGR	TTIIVAHRLS	TIRNVDRIFV	FKAGNIVESG	SHEELMSKQG	IFYDMTQAOV
	VRQQQEAGK	DIEDTISESA	HSHLSRKSST	RSASISATSI	HQLAEVEEC	KAPPTSMFKI	FKFNGDKVGW
	FIGGIFGAFI	FGSVTPVFAL	VYAEIFNVYS	LPADQMQLANV	YFWCGMFVLM	GITFFVGFFT	SANCLGRCGE
15	SLTMKLRFEA	FKNLLRQDIA	FYDDL RHGTG	KLCTRFATDA	PNVRYVFTRL	PVVLASIVTI	CGALGIGFYY
	GWQLALILVV	MVPLLVMGGY	FEMQMRFGKQ	IRDTQLLEEA	GKVASQAVEH	IRTVHSLNRQ	EQFHFTYCEY
	LREPNTNLK	HAHTYGAVFA	FSQSLIFFMY	AAAFYLGSI	VNQAMQPID	VYRVFFAISF	CGQMIGNTTS
	FIPDVVKARL	AASLLFYLIE	HPTPIDSLSD	SGIVKPITGN	ISIRNVFFNY	PTRKDTKVLO	GFTLDIKAGK
	TVALVGHSGC	GKSTIMGLLE	RFYNQDKGMI	MIDGDNIRNL	NISSLREQVC	IVSQEPTLFD	CTIGENICYG
20	TNRNVTYQEI	VEAAKMANIH	NFILGLPDGY	DTHVGEKGTQ	LSGGQKQRIA	IARALVRSPS	VLLLDEATSA
	LDTESEKIVQ	EALDAAKQGR	TCLVIAHRLS	TIQNSDVIAI	VSEGKIVEKG	THDELIRKSE	IYQKFCETQR
	IVESQ						

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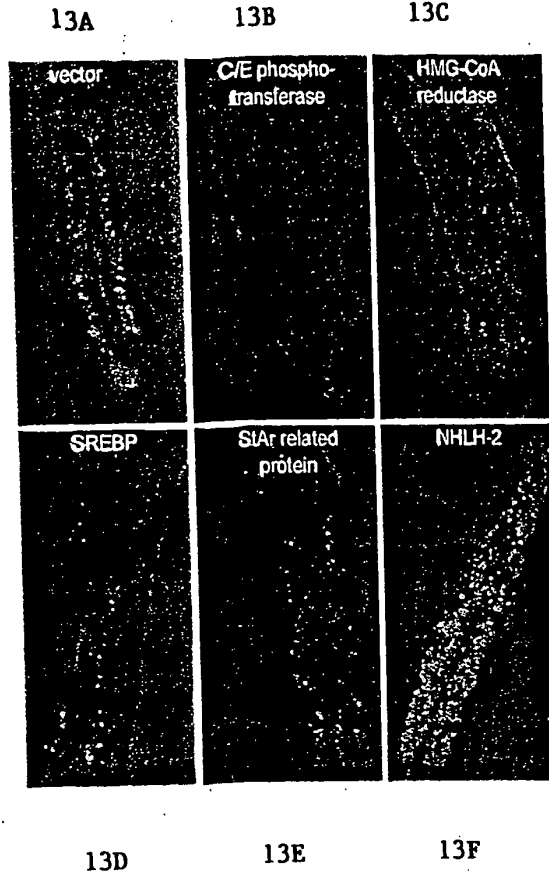
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Figure 12G

5	human	MDLEGDRNGGAKKKNFFKLNNKSEKDKKEKKPTVSVFSMFRYSNWLDKLYMVVGTAAII	60	SEQ ID NO:11
	MOUSE	MEFEENLKGGRADK-NFSKMGKKSKEKKEKKPAVGVFGRYADWLDKLCMILGTAAII	59	SEQ ID NO:12
	LPO-3	MKSRKNEPTWVTK-PLLRSHSSDSSIDESTVKLTNYGIFYTQGVDDLLLTGTVAIVI	59	SEQ ID NO:6
* . . . : * . : * * : : * * : : * * : : * * : *				
10	human	HGAGLPLMLLVFGEMTDIFANAGNLEDLSNITNRSNDINDTGFFMN--LEEDMTRYAYYY	118	
	MOUSE	HGTLPLMLLVFGNMNDSFTKA--EASILPSITNQSGPNSTLIISNSSLEEEMAIYAYYY	117	
	LPO-3	HGAGFPLLAIVLGGMTTVFLRAQ-NSDFVVGVDN-VNPEGLVPISLDEFNSEVVKYCIYY	117	
** : ** : * : * * * . * . . : : * . . : : : . * . **				
15	human	SGIGAGVLVAAYIQVSFWCLAAGRQIHKIRKQFFHAIMRQEIGWFDVHDVDELNRLTDD	178	
	MOUSE	TGIGAGVLIVAYIQVSLWCLAAGRQIHKIRKQFFHAIMNQEIGWFDVHDVDELNRLTDD	177	
	LPO-3	LVLGVLMTFTSYVQIACFESYAEERLVHKLRLQNYLKAILRQIQWFDKQQTGNLRLTDD	177	
: * . : : : * : : : * * : * : : : * : * : * : * : * : * : * : *				
20	human	VSKINEGIGDKIGMFFQSMATFTTGFIWGTGRWKLTLVILAIAPVLGLSAAVWAKILSS	238	
	MOUSE	VSKINDGIGDKIGMFFQSITTFLAGFIIGFISGWKLTLVILAVSPLIGLSSALWAKVLTS	237	
	LPO-3	LERVREGLGDKFALLVQMFAAFLAGYGVGFYSWSMTLVMMGFAPLIVLSGAKMSKSMAT	237	
: : : : * : * : : : * : : : : * * . * : * : * : : * : * : *				
25	human	FTDKELLAYAKAGAVAEVLAARTVIAFGGQKKELERYNKNLEAKRIGIKKAITANIS	298	
	MOUSE	FTNKLQAYAKAGAVAEVLAARTVIAFGGQKKELERYNKNLEAKNVGIKKAITASIS	297	
	LPO-3	RTRVEQETAYAVAGIAEETFSSIRTVHSLNGHKRELDREYNALVEGRQTGIVKYCYMGIG	297	
* * : * * : * : * : * : * : * : * : * : * : * : * : * : *				
30	human	ICAAFLLIYASYALAFWYGTTLVLSG-EYSIGQVLTFFSVLIGAFSVGQASPSIEAFAN	357	
	MOUSE	IGIAYLLVYASYALAFWYGTSLVLSN-EYSIGEVLTFFSILLGTFSIGHLAPNIEAFAN	356	
	LPO-3	VGFSNLCMYSSYALAFWYGSTLIINDPTFDRGLIFTVFFAVLSGSTSLGGALPHLASFGT	357	
: * : * : * : * : * : * : * : : . * : * : * : * : * : * : *				
35	human	ARGAAYEIFKIIDNKPSIDSYSKSGHKPDNIKGNLEFRNVHFSYPSRKEVKILKGLNLKV	417	
	MOUSE	ARGAAYEIFKIIDNEPSIDSFSTKGYKPDSIMGNLEFKNVHFNYPSPRSEVQILKGLNLKV	416	
	LPO-3	ARGAASTVLRVINSHPKIDPYSLEGILVDNMKGDISFKDVHFRYPSRKDIHVLKGISLEL	417	
***** : : : : * . * : * . * : * : * : * : * : * : * : *				
40	human	QSGQTVALVGNSSGCGKSTTVQLMQRLYDPTGEMVSVDDQDIRTINVRFLREIIGVVSQEP	477	
	MOUSE	KSGQTVALVGNSSGCGKSTTVQLMQRLYDPLEGVVSDGQDIRTINVRFLREIIGVVSQEP	476	
	LPO-3	KAGDKIALVGNSSGCGKSTIVNLLQRFYDPTKGRVLIDGVDLRENVHSLREQIGIVSQEP	477	
: : * : * : * : * : * : * : * : * : * : * : * : * : * : *				
45	human	VLFATTIAENIRYGRNVMTDEIEKAVKEANAYDFIMKLPKFDTLVGERGAQLSGGQKQ	537	
	MOUSE	VLFATTIAENIRYGRNVMTDEIEKAVKEANAYDFIMKLPKFDTLVGERGAQLSGGQKQ	536	
	LPO-3	VLFDTGTIYENIKMGNEHATHDQVVEACKMANANDFIKRLPDGYGTRVGEKGVQLSGGQKQ	537	
*** * * : * . * : * : * * * * * : * . : * * : * : * : *				
50	human	RIAIARALVRNPKILLDEATSALDTESEAVVQVALDKARKGRTTIVIAHRLSTVRNADV	597	
	MOUSE	RIAIARALVRNPKILLDEATSALDTESEAVVQAALDKAREGRTTIVIAHRLSTVRNADV	596	
	LPO-3	RIAIARALVRNPKILLDEATSALDTEAEREVQALDQAQAGRTTIVIAHRLSTIRNVDR	597	
***** : * : * : * : * : * : * : * : * : * : * : * : *				
55	human	IAGFDDGVIVEKGNHDELMKEKGIYFKLVMTQTAGNEVELENAADESKSEIDALEMSSND	657	
	MOUSE	IAGFDGGVIVEQGNHDELMREKGIYFKLVMTQTRGNEIEPGNNAYGSQSDTDASELTSEE	656	
	LPO-3	IFVFKAGNIVESGSHEELMSKQGIYDMTQAQVVRQQQ-----EAGKDIEDTISES	649	
* * . * * : * : * : * : * : * : * . : : : : * : * :				
60	human	SRSSLIRKRSTRSVRGSQAQDRKLSTKEALDESIPPVSFWRIMKLNLTWPYFVVGVC	717	
	MOUSE	SKSPLIR-RSIYRSVHRKQDQERRLSMKEAVDEDPVLSFWRILNLTWPYFVVGVC	715	
	LPO-3	AHSHLSRKSSTRSAIS--IATSIHQLAEEVEECKAPPTSMFKIFKFNKGVGWFIFGIFG	707	
: : * * . * : : . : : * : . * : * : * : * : : * : *				
65	human	AIINGGLQPAFAIIFSKIIGVFTRIDDPETKRQNSNLSLLFLALGIIISFITFLQGFTF	777	
	MOUSE	AVINGCIQPVFAIVFSRIYGVFSRDDHETKRQNCNLSLFFLVMLISFVTFYFQGF	775	
	LPO-3	AFIFGSVTPVFALVYAEIFNVYSLPAD--QMQANVYFWCGMFLMGITFFVGFFTSANCL	765	
* . * : * : * : * : * : * . : * : * : * : * : * : *				
70	human	GKAGEILTKRLRYMVFRSMLRQDVSFDDPKNTTGALTTRLANDAAQVKAIGSRLAVIT	837	
	MOUSE	GKAGEILTKRVRYMVFKSMLRQDISWDDHKNSTGSLTTRLASDASSVKGAMGARLAVVT	835	
	LPO-3	GRCGESLTMKLRFEAFKNLLRQDIAFYDDLRLHGTGKLCRFRATDAPNVR-YVTRLPVVL	824	
* . * * * : : . : * : * : * : * : * : * : * : * : * : *				

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human	QNANLGTGIIISFIYGWQLTLLLLLAIVPIIAIAGVVMKMLSGQALDKDKELEGAGKIA	897
MOUSE	QNVANLGTGVILSLVYGWQLTLLLVVIIPLIVLGGIIEMKLLSGQALDKDKQLEISGKIA	895
LPO-3	ASIVTICGALGIGIFYGWQLALILVVMVPLLVMGGYFEMQMRFKGQRDTQLLEEAGKVA .: : .: : : *****: *: : : : : : * .*: : * : : : : * : ***:	884
human	TEAIENFRTVSVSLTQEQQFEHMYAQSLSQVPYRNSLRKAHIFGITFSFTQAMMYFSYACGF	957
MOUSE	TEAIENFRITVSLTREQKFETMYAQSLQVPYRNAMKKAHVFGITFSFTQAMMYFSYAACF	955
LPO-3	SQAVEHIRTIVHSLNRQEQFHFTYCEYLREPNTNLKHAHTYGAVFAFSQSILFFMYAAAF : *: *: **: * : : : : * . * : * : * : . : **: * . *: *: : : : * * : *	944
human	RFGAYLVAHKLMSSFEDVLLVFSAVVFGAMAVQVSSFPADYAKAKISAHHIMIEKTPL	1017
MOUSE	RFGAYLVAQQLMTFENVMLVFSAVVFGAMAAGNTSSFPADYAKAKVSASHIIRIEKTPE	1015
LPO-3	YLGSI FVNQQAMQP IDVYRVFAISFCGQMIGNTTSFIDPVVKARLASLFLYLIEHPTP : *: * : : * : * * * : * . *: : ** * . *. : : : : : : : : **: :	1004
human	IDSYSTEGLMPNLTLEGNVTFGEVVFNYPTRPDIPVLQGLSLEVKKGQTALVGSSGCGKS	1077
MOUSE	IDSYSTEGLKPTLLEGNVKFGVQFNYPTRPNIPVLQGLSLEVKKGQTALVGSSGCGKS	1075
LPO-3	IDSLSDSGIVK - PITGNISIRNVFFNYPTRKDTKVLQGFTLDIKAGTKVALVGHSGCGKS *** * .*: . : **: : . * **** : *****: : : * *:***** *****	1063
human	TVVQLLERFYDPLAGKVLLDGKEIKRLNVQWLRAHLGIVSQEPILFDCSIENIAYGDNS	1137
MOUSE	TVVQLLERFYDPMAGSVFLDGKEIKQLNVQWLRAHLGIVSQEPILFDCSIENIAYGDNS	1135
LPO-3	TIMGRLERFYNQDKGMIMIDGDNIRNLNISSLREQVCIVSQEPTLFDCITIGENICYGTN- *: : ***** * : : : : : : : : : * : : ***** *****: **.**** * :	1122
human	RVVQEEIVRAAKEANIHFIESLPNKYSTKVGDKGTQLSGGQKORIAIARALVRQP HIL	1197
MOUSE	RAVSHEEIVRAAKEANIHQFIDLSPDKYNTRVGDKGTQLSGGQKORIAIARALVRQP HIL	1195
LPO-3	RNVTYQEIVEAAKMANIHNFILGPLDGYDTHVGEKGTQLSGGQKORIAIARALVRS PVL * * : :*.**.* ** ** * .*: * *: :*.***** ***: ***. * :	1182
human	LLDEATSALDTESEKVVQEALDKAREGRTCIVIAHRLSTIQNADLIVVFQNGRVKEHGTH	1257
MOUSE	LLDEATSALDTESEKVVQEALDKAREGRTCIVIAHRLSTIQNADLIVVIENGKVKEHGTH	1255
LPO-3	LLDEATSALDTESEKIVQEALDAKQGRTCLVIAHRLSTIQNSDVIAIVSEGI VEKGTH *****:***** *: :*: :*****:*****:*. :. :. :*: :*	1242
human	QQLLAQKGIYFSMSVQAGTKRQ	1280
MOUSE	QQLLAQKGIYFSMV - QAGAKRS	1276
LPO-3	DELIRKSEIYQKFCTQRIVESQ : *: : .	1265



FIGURES 13A-13F